



# APPRAISAL BULLETIN

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## FUTURE INCOME AND PRESENT VALUE

**W**HILE we live our lives in an ever-changing present, the present actually is that fleeting moment when the future becomes the past. In this sense there are but two periods of time - the one stretching from the present back into the past, and the other, from the present forward into the future.

The appraiser recognizes that present value is a flash value and in its determination uses both the periods in the past and in the future when possible. With the cost approach in finding present value, all of the depreciation that has accrued during the expended or past life of the property is deducted from the present reproduction cost. With the income approach all of the future net income or returns which can be reasonably expected are capitalized to present value. It is evident that present value should be the same in amount, regardless of whether factors in the past or in the future are used in its determination.

Each of these approaches to present value from the past and from the future complements the other and can be used as a check on the other. The appraiser is aware of the difficulty when using the cost approach alone to find the accrued depreciation allowance for such adverse economic conditions as inaccessibility, inadequate land use, excess capacity, etc. The income approach alone leaves the feeling of uncertainty in finding present value, although the present value of future benefits represents the basic concept of value.

Naturally, everything we buy is for future use, whether it be for minutes, hours, years, or a lifetime, as in the case of a meal, a moving picture, an automobile or a house. When use can be reduced to a future net income as is the case with investment properties, this future income can be capitalized to a present value. It should be stressed that the simple capitalization process of dividing a present annual sum of \$5,000 by a rate of 5 per cent and securing thereby a present capital sum of \$100,000 involves the assumption or forecast that the \$5,000 annual sum will continue in the future in like amount forever.

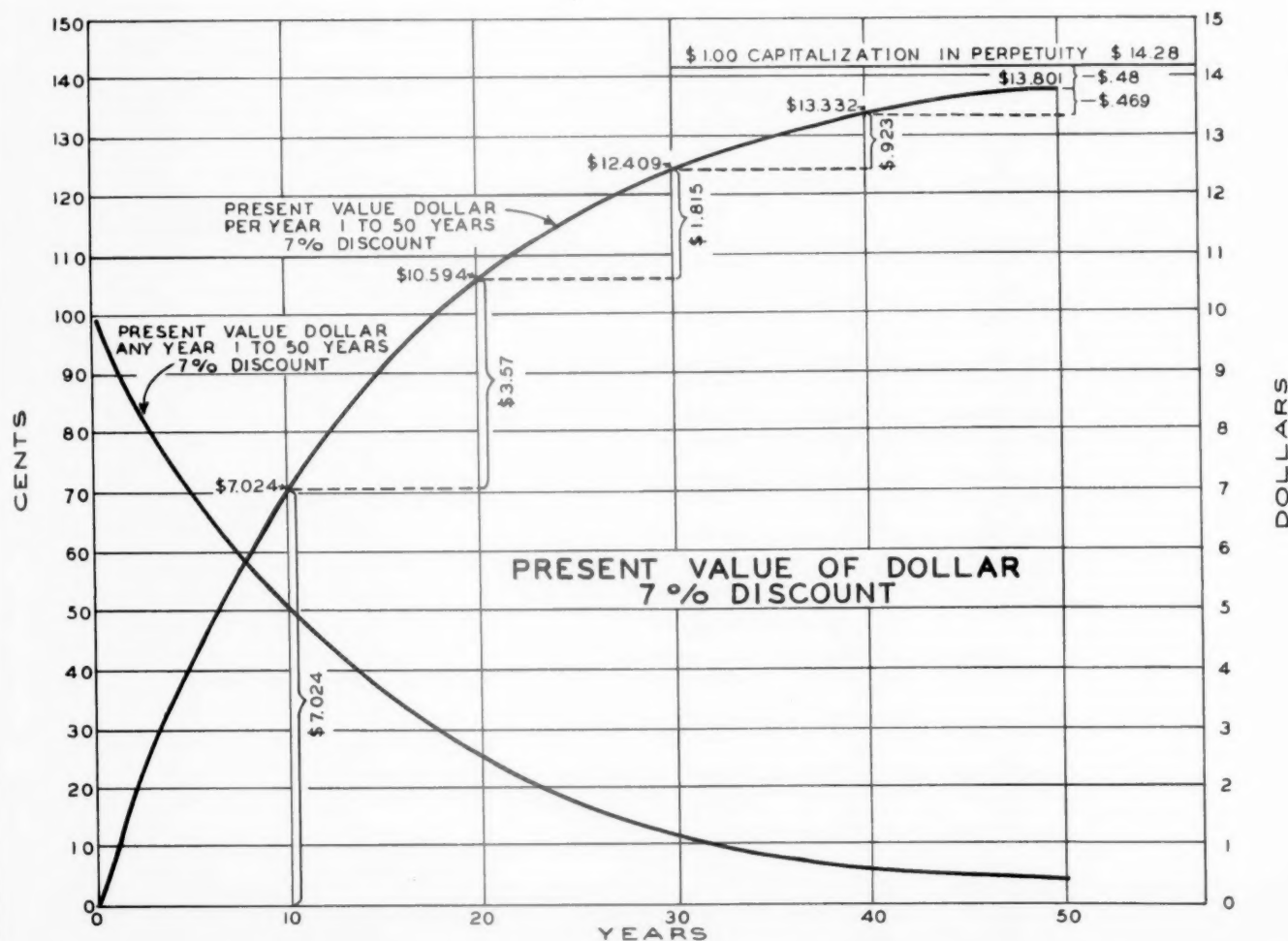
In order to visualize the capitalization process of finding the present value of a dollar to be received at various times in the future, the chart on page 246 has been prepared which shows the present value of one dollar received in any year from one to 50 years, and the present value of one dollar per year received from one to 50 years, discounted in both cases at 7 per cent. There is a tendency to forget the rapid decline in the present value of the dollar to be received at more distant times in the future. Thus the dollar which has a present value of \$1.00, if received today, has a present value of 50.8¢ if received 10 years from today,

25.8¢ if received 20 years from today, 12.1¢ if received in 30 years, 6.7¢ if received in 40 years, and 3.4¢ if received in 50 years. Likewise, the present value of an annuity of \$1.00 beginning 50 years from date and continuing throughout eternity would amount to only 48¢. The present value at \$1.00 per year for the first 10 years is \$7.024 the second 10 years, \$3.57; the third 10 years, \$1.815; the fourth 10 years, \$0.923; and the fifth 10 years, \$0.469.

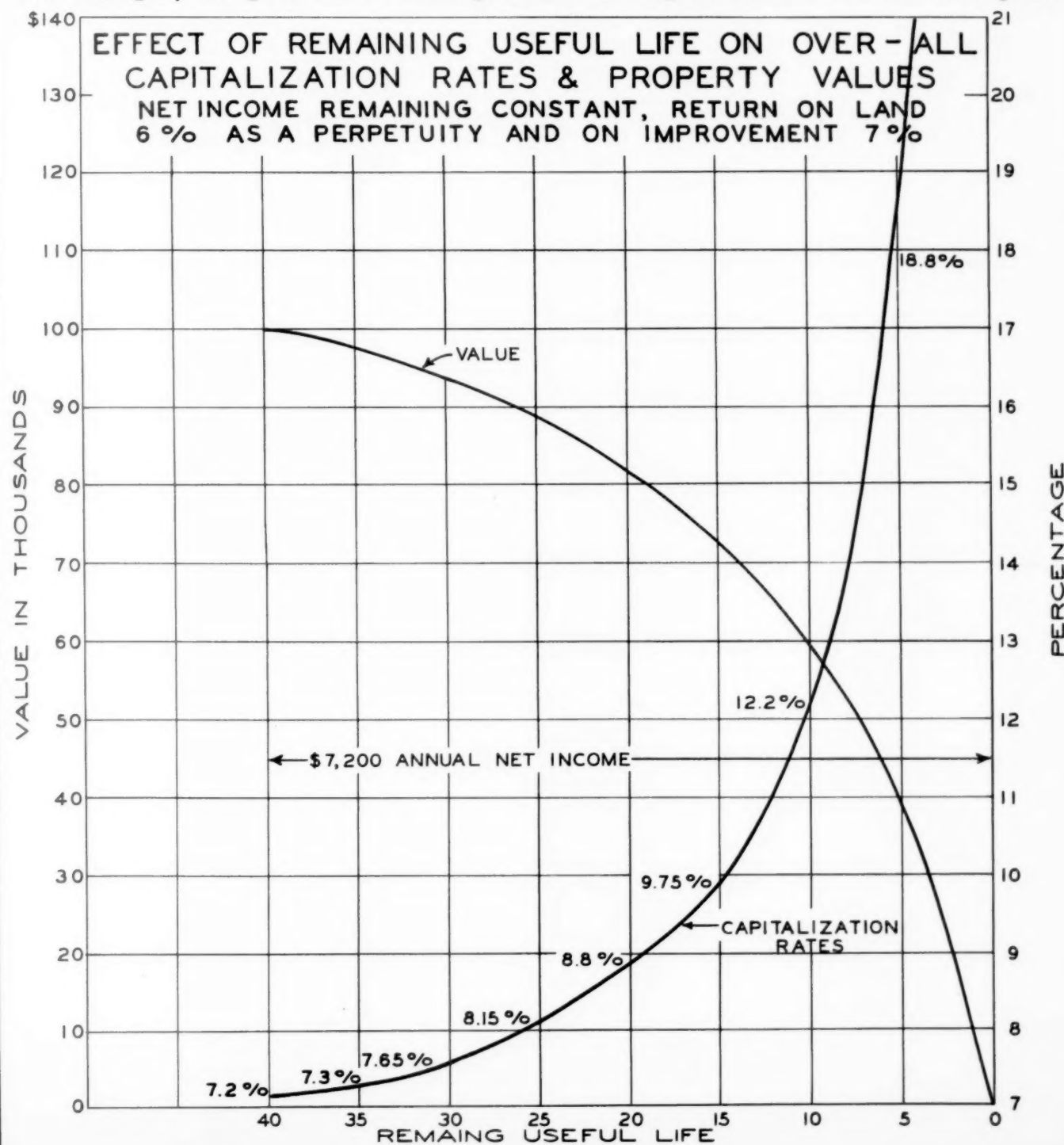
Before the appraiser capitalizes expected net income to present value, he must decide on (a) the volume of net income which reasonably can be expected; and (b) the remaining economic life, or that period in the future during which net income volume requires an estimate of (1) the future full-use gross income, less (2) the loss in full-use income from vacancies and non-collections, and (3) the property expenses which can reasonably be expected.

Every factor which in the appraiser's opinion will probably affect the income volume must be given consideration. Such factors as an expected increase or decline in construction costs, rents and values caused by an upward or downward cyclic swing, or the changes expected to result from a shift in neighborhood activity, or from decentralization must be studied by the appraiser before he makes a decision.

The selection of the remaining useful life is a part of the capitalization process



and is the same as the selection of the capitalization rate. In order to show the effect on present value that the different remaining useful lives will have, the chart on page 247 has been prepared. The vertical scale on the chart gives the value of the property in thousands of dollars, and the horizontal scale gives the remaining economic lives from 0 to 40 years. In figuring the value of the property, a uniform annual net income of \$7,200 was used for each different remaining life; also, in each case the value of the improvements to the value of the land was kept at a constant ratio of 4 to 1. The capitalization process determined the value of the land by capitalizing that part of the net income applicable to the land at 6 per cent as a perpetuity. The value of the improvements was determined by capitalizing the residual net income to present value using a rate of 7 per cent. For example, the process of finding value and capitalization rate for a 30-year





remaining life is as follows:

Total net income .....	\$7,200	
Net income applicable to land .....	1,130	
Net income applicable to improvements .....	6,070	
Value of land - $\$1,130 \div .06$ .....	\$18,800	- 20%
Value of improvements - $\$6,070 \times 12.409$ .....	75,300	- 80%
Total Value .....	\$94,100	- 100%
Capitalization Rate $\$7,200 \div \$94,100 =$	7.65%	

It will be noticed that the value of the property dropped from 100 per cent to 74 per cent resulting from a decline in remaining economic life from 40 to 15 years and dropped from 74 to 0 resulting from a decline in economic life from 15 years to 0. It will be noticed that the over-all capitalization rate which was 7.2 per cent for a 40-year remaining life increased to 9.75 per cent for a 15-year remaining life; below a 15-year remaining life the rate increases rapidly and, as it approaches 0, the rate approaches infinity.

Our estimate that the land has no value when the remaining life of the improvements reaches 0 is due to the fact that it was assumed that a constant ratio between the improvements and the land existed. Perhaps a higher use of the land would be found before this point were reached.

The appraiser and mortgagee can use these capitalization rates with reasonable accuracy in making pre-appraisals of many investment properties. The selection of a proper remaining economic life is one of the important factors in the capitalization process.

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